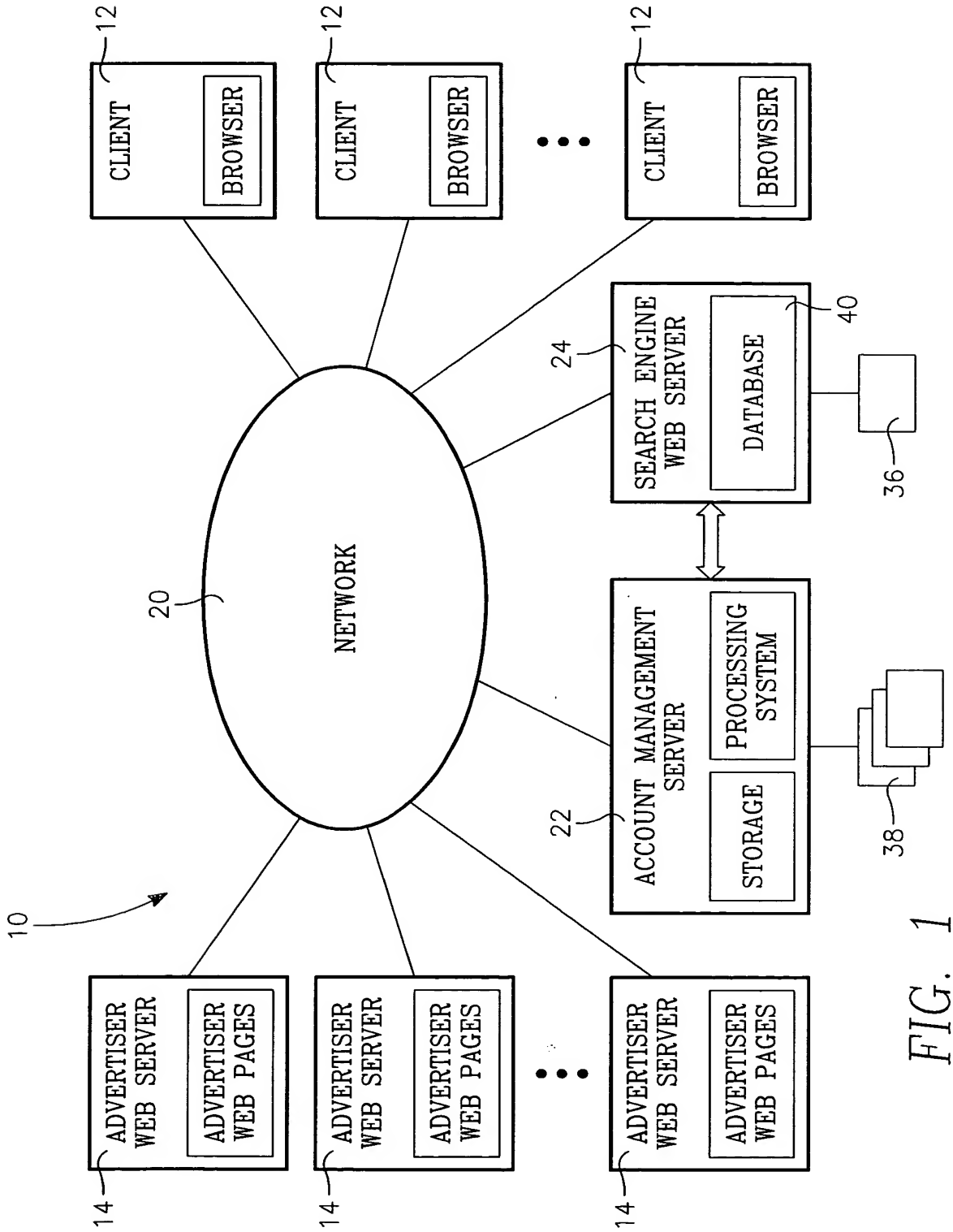
10
12
CLIENT
BROWSER
12
CLIENT
BROWSER
12
CLIENT
BROWSER
20
NETWORK
24
SEARCH ENGINE WEB SERVER
DATABASE
40
36
22
ACCOUNT MANAGEMENT SERVER
PROCESSING SYSTEM
STORAGE
38
14
ADVERTISER WEB SERVER
ADVERTISER WEB PAGES
14
ADVERTISER WEB SERVER
ADVERTISER WEB PAGES
14
ADVERTISER WEB SERVER
ADVERTISER WEB PAGES

FIG. 1

200

TERMS (210)	FIRST COFFEE MERCHANT (220)	COMPUTER PROGRAMMER (230)	SECOND COFFEE MERCHANT (240)
JAVA	x	x	x
COFEE	x		
COFFEE	x		x
COFFEE GIFT	x		x
VINEYARD	x		
PROGRAMMING JAVA		x	
PROGRAMMING		x	
BEVERAGE			x
TEA			x
ANSI C		x	
BUILD WEB SITE		x	

FIG. 2

$$A = \begin{pmatrix} 1 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 \\ 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 0 \end{pmatrix}$$

FIG. 3

$$C' = \begin{array}{l} \\ \text{FIRST COFFEE MERCHANT} \\ \text{COMPUTER PROGRAMMER} \\ \text{SECOND COFFEE MERCHANT} \end{array} \begin{array}{c} \begin{array}{ccc} \text{FIRST COFFEE MERCHANT} & \text{COMPUTER PROGRAMMER} & \text{SECOND COFFEE MERCHANT} \end{array} \\ \begin{pmatrix} 1 & -0.4667 & 0.2667 \\ -0.4667 & 1 & -0.4667 \\ 0.2667 & -0.4667 & 1 \end{pmatrix} \end{array}$$

FIG. 4

$$M = \begin{array}{l} \\ \text{FIRST COFFEE MERCHANT} \\ \text{COMPUTER PROGRAMMER} \\ \text{SECOND COFFEE MERCHANT} \end{array} \begin{array}{c} \begin{array}{ccc} \text{FIRST COFFEE MERCHANT} & \text{COMPUTER PROGRAMMER} & \text{SECOND COFFEE MERCHANT} \end{array} \\ \begin{pmatrix} 5 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 5 \end{pmatrix} \end{array}$$

FIG. 5

$$C = \begin{array}{l} \\ \text{FIRST COFFEE MERCHANT} \\ \text{COMPUTER PROGRAMMER} \\ \text{SECOND COFFEE MERCHANT} \end{array} \begin{array}{c} \begin{array}{ccc} \text{FIRST COFFEE MERCHANT} & \text{COMPUTER PROGRAMMER} & \text{SECOND COFFEE MERCHANT} \end{array} \\ \begin{pmatrix} 1 & -0.866025 & 0.5 \\ 0.866025 & 1 & -0.866025 \\ & 0.866025 & 1 \end{pmatrix} \end{array}$$

FIG. 6

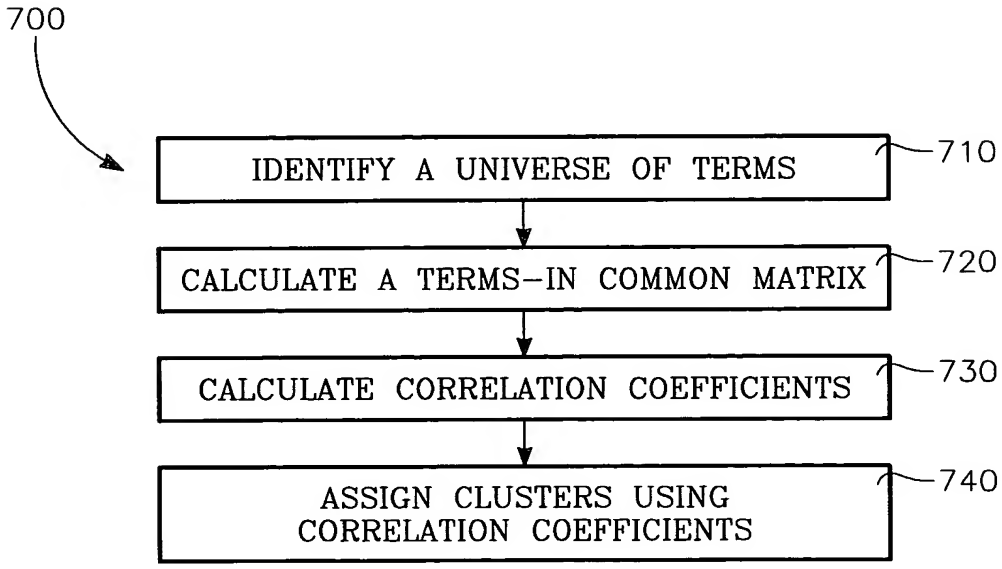

FIG. 7

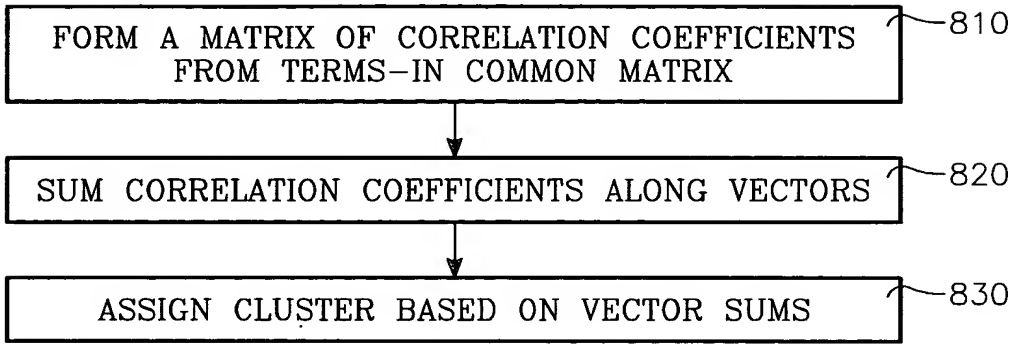
FORM A MATRIX OF CORRELATION COEFFICIENTS FROM TERMS-IN COMMON MATRIX
810
SUM CORRELATION COEFFICIENTS ALONG VECTORS
820
ASSIGN CLUSTER BASED ON VECTOR SUMS
830

FIG. 8

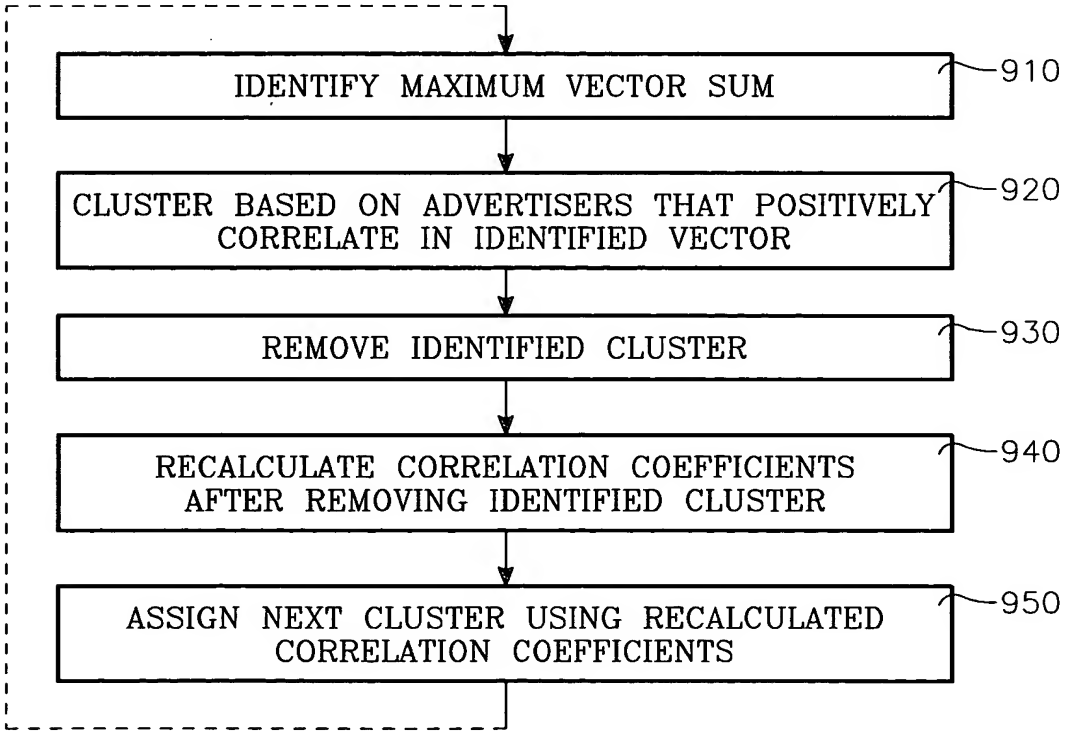
IDENTIFY MAXIMUM VECTOR SUM
910
CLUSTER BASED ON ADVERTISERS THAT POSITIVELY CORRELATE IN IDENTIFIED VECTOR
920
REMOVE IDENTIFIED CLUSTER
930
RECALCULATE CORRELATION COEFFICIENTS AFTER REMOVING IDENTIFIED CLUSTER
940
ASSIGN NEXT CLUSTER USING RECALCULATED CORRELATION COEFFICIENTS
950

FIG. 9

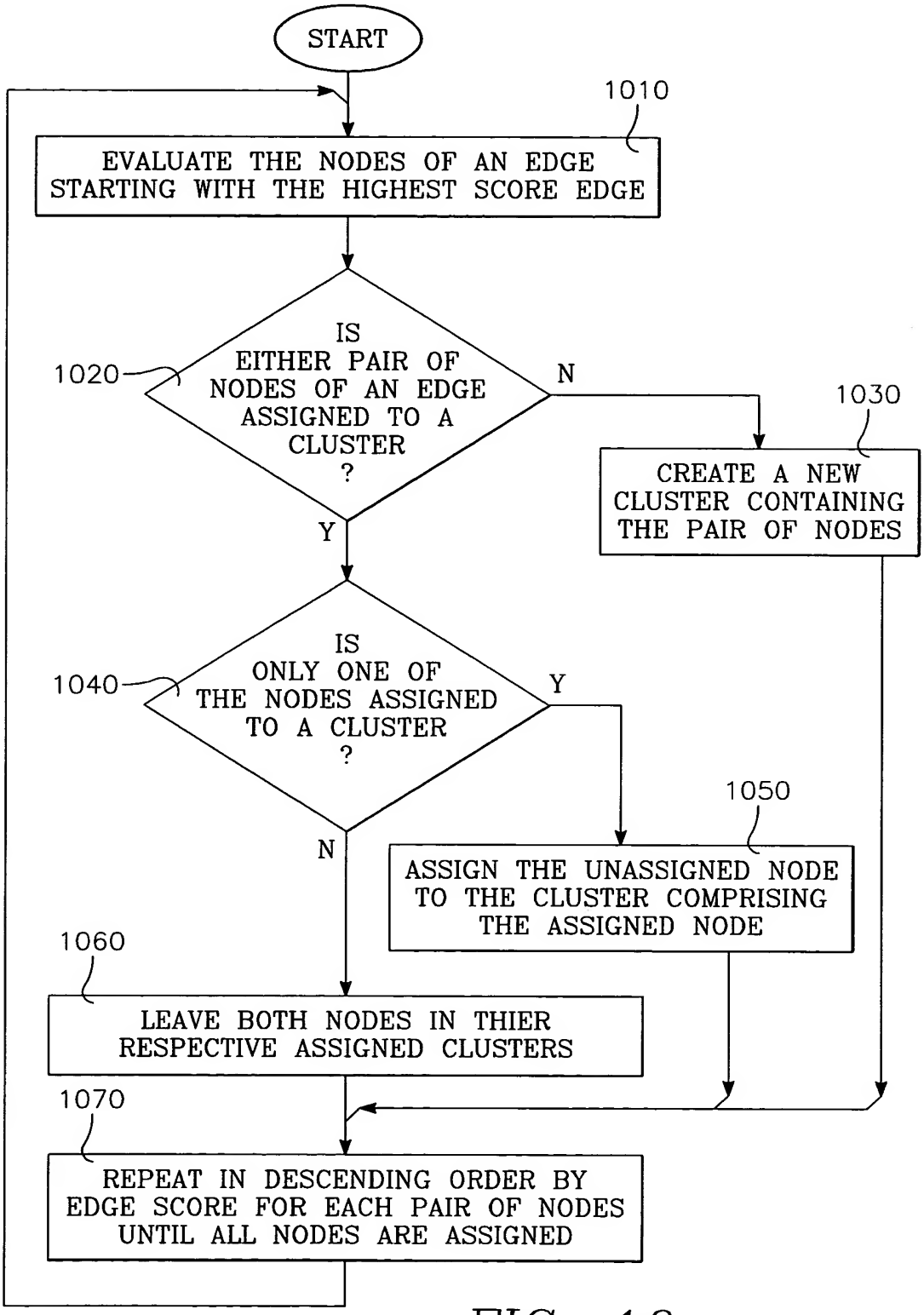
START
1010
EVALUATE THE NODES OF AN EDGE STARTING WITH THE HIGHEST SCORE EDGE
1020
IS EITHER PAIR OF NODES OF AN EDGE ASSIGNED TO A CLUSTER ?
N
1030
CREATE A NEW CLUSTER CONTAINING THE PAIR OF NODES
Y
1040
IS ONLY ONE OF THE NODES ASSIGNED TO A CLUSTER ?
Y
1050
ASSIGN THE UNASSIGNED NODE TO THE CLUSTER COMPRISING THE ASSIGNED NODE
N
1060
LEAVE BOTH NODES IN THIER RESPECTIVE ASSIGNED CLUSTERS
1070
REPEAT IN DESCENDING ORDER BY EDGE SCORE FOR EACH PAIR OF NODES UNTIL ALL NODES ARE ASSIGNED

FIG. 10

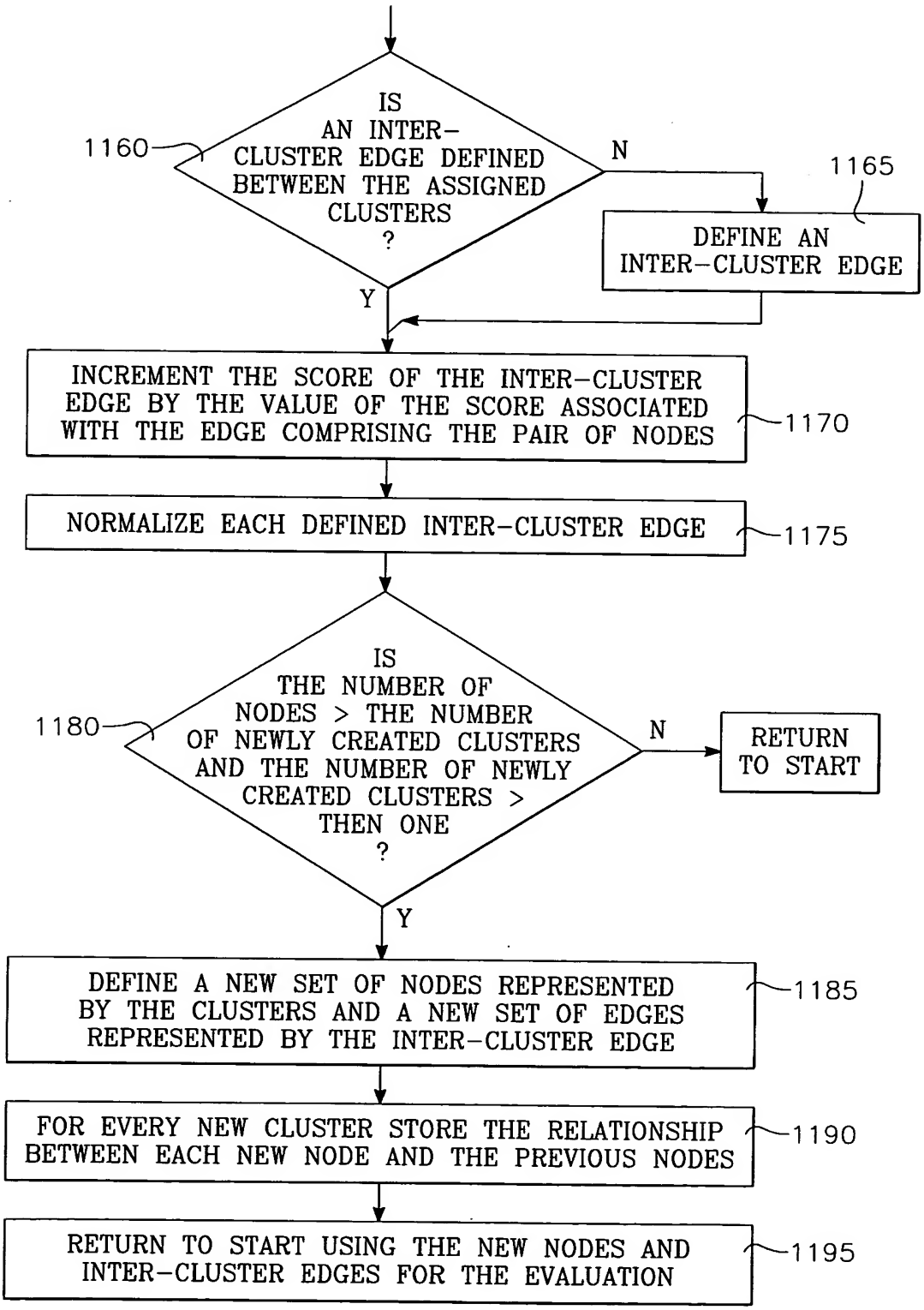
IS AN INTER-CLUSTER EDGE DEFINED BETWEEN THE ASSIGNED CLUSTERS ?
1160
N
1165
DEFINE AN INTER-CLUSTER EDGE
Y
INCREMENT THE SCORE OF THE INTER-CLUSTER EDGE BY THE VALUE OF THE SCORE ASSOCIATED WITH THE EDGE COMPRISING THE PAIR OF NODES
1170
NORMALIZE EACH DEFINED INTER-CLUSTER EDGE
1175
IS THE NUMBER OF NODES > THE NUMBER OF NEWLY CREATED CLUSTERS AND THE NUMBER OF NEWLY CREATED CLUSTERS > THEN ONE ?
1180
N
RETURN TO START
Y
DEFINE A NEW SET OF NODES REPRESENTED BY THE CLUSTERS AND A NEW SET OF EDGES REPRESENTED BY THE INTER-CLUSTER EDGE
1185
FOR EVERY NEW CLUSTER STORE THE RELATIONSHIP BETWEEN EACH NEW NODE AND THE PREVIOUS NODES
1190
RETURN TO START USING THE NEW NODES AND INTER-CLUSTER EDGES FOR THE EVALUATION
1195

FIG. 11

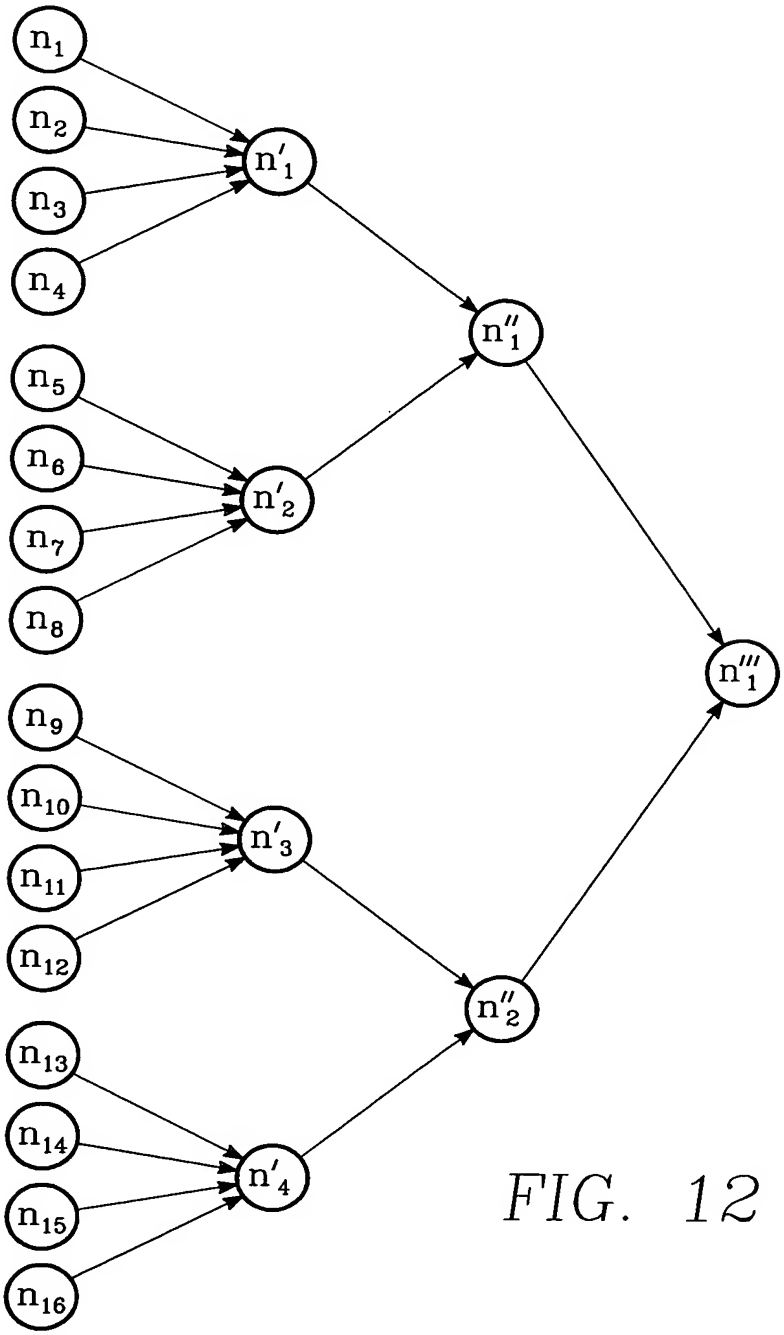
n_1
n_2
n_3
n_4
n_5
n_6
n_7
n_8
n_9
n_{10}
n_{11}
n_{12}
n_{13}
n_{14}
n_{15}
n_{16}
n'_1
n'_2
n'_3
n'_4
n''_1
n''_2
n'''_1

FIG. 12

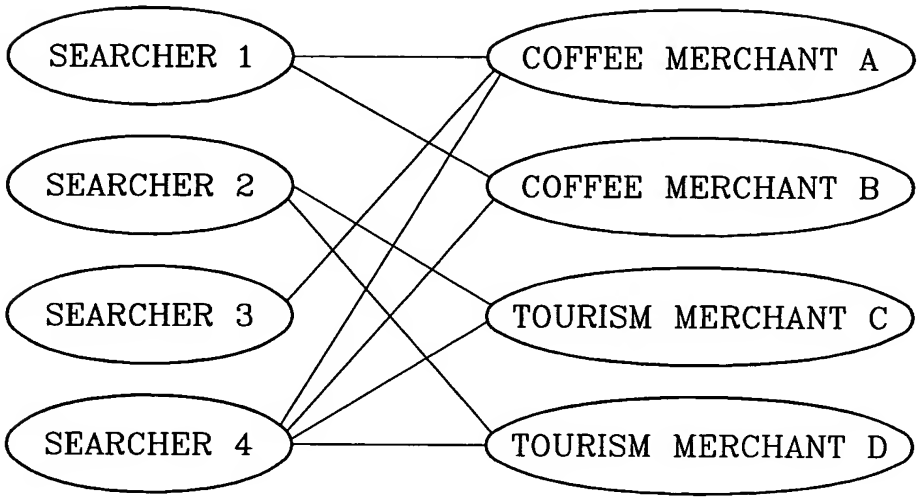

FIG. 13

$A' =$

	COFFEE MERCHANT A	COFFEE MERCHANT B	TOURISM MERCHANT C	TOURISM MERCHANT D
SEARCHER 1	1	1	0	0
SEARCHER 2	0	0	1	1
SEARCHER 3	1	0	0	0
SEARCHER 4	1	1	1	1

FIG. 14

$S_1 =$

	FIRST COFFEE MERCHANT	COMPUTER PROGRAMMER	SECOND COFFEE MERCHANT
FIRST COFFEE MERCHANT	1	0	1
COMPUTER PROGRAMMER	0	0	0
SECOND COFFEE MERCHANT	1	0	1

FIG. 15A

$S_2 =$

	FIRST COFFEE MERCHANT	COMPUTER PROGRAMMER	SECOND COFFEE MERCHANT
FIRST COFFEE MERCHANT	1	0	1
COMPUTER PROGRAMMER	0	0	0
SECOND COFFEE MERCHANT	1	0	2

FIG. 15B

$S_n =$

	FIRST COFFEE MERCHANT	COMPUTER PROGRAMMER	SECOND COFFEE MERCHANT
FIRST COFFEE MERCHANT	20	3	10
COMPUTER PROGRAMMER	3	16	2
SECOND COFFEE MERCHANT	10	2	22

FIG. 15C

$C_{java} =$

	FIRST COFFEE MERCHANT	COMPUTER PROGRAMMER	SECOND COFFEE MERCHANT
FIRST COFFEE MERCHANT	1	−0.958187	0.788139
COMPUTER PROGRAMMER	−0.958187	1	−0.931305
SECOND COFFEE MERCHANT	0.788139	−0.931305	1

FIG. 16